An Inventory of Biological Samples Taken in the British Columbia Groundfish Fishery During 1980

N. L. Venables

Department of Fisheries and Oceans
Fisheries Research Branch
Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

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AN INVENTORY OF BIOLOGICAL SAMPLES TAKEN IN THE BRITISH COLUMBIA GROUNDFISH FISHERY DURING 1980

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N. L. Venables

Department of Fisheries and Oceans

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ABSTRACT

Venables, N. L. 1983. An inventory of biological samples taken in the British Columbia groundfish fishery during 1980. Can. Data Rep. Fish. Aquat. Sci. 376: iii + 18 p.

An inventory of biological samples taken in the British Columbia groundfish fishery during 1980 is presented. Samples are separated by species, area, time, depth range, sex and type of sample. A total of 262 samples of 20 species were collected. Sampling by species generally reflected abundance in landings except where special research considerations applied.

Key words: Groundfish fishery, biological sampling.

RESUME

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Le présent inventaire porte sur les échantillons biologiques prélevés en 1980 au cours de la pêche du poisson de fond en Colombie-Britannique. Les 262 échantillons recueillis sont divisés selon les 20 espèces rencontrées, la zone, le temps, les écarts de profondeur, le sexe et le genre d'échantillons. L'échantillonnage selon l'espèce reflète généralement l'abondance dans les débarquements sauf lorsqu'il y a des considérations scientifiques particulières.

Mots-clés: pêche du poisson de fond, échantillonnage biologique

INTRODUCTION

The collection of biological samples from the groundfish fishery off the west coast of Canada is an important function of the Pacific Biological Station's groundfish program. Biological sampling is fundamental to our understanding of the dynamics of groundfish stocks, especially considering the extended longevity of many of these species (e.g. rockfish, sablefish, flatfish and dogfish).

Sampling is conducted primarily at the ports of Vancouver, Steveston and Prince Rupert, and at sea aboard commercial fishing vessels. Annual reports of these activities have been published in this format since 1970.

Sampling generally reflects changes in the fishery and 1980 was no exception. The total number of flatfish samples decreased dramatically (particularly rock sole) as did the number of Pacific cod samples (only somewhat less so). In the prime statistical areas for rock sole (5C and 5D, Fig. 1) total landing figures fell significantly and individual vessel landings were fewer with larger catches, particularly January through March. The most notable drop in the number of Pacific cod samples occurred in Area 3C. This was a direct result of the January to March closure for Pacific cod fishing, a conservative measure taken to protect cod stocks. The total number of Pacific ocean perch samples collected during 1980 was approximately the same as for 1979 but the areas from which these samples came changed greatly. This reflected a marked increase in effort by the commercial fleet toward ocean perch stocks in Areas 5B and 5C (Moresby Gulley in particular). Far fewer walleye pollock samples were collected from Area 5D (Dixon Entrance) in 1980 vs 1979 due to a reduction of commercial effort on that species. This reduced effort resulted from a high percentage of juvenile fish in the vessel catches. A very sharp drop in the total number of dogfish samples collected (particularly in Area 4B) occurred when landings decreased dramatically in the latter portion of the year. This was a result of poor market demand for dogfish.

Sablefish landings showed a very large increase but sampling opportunities were limited. Nearly all of the increased effort toward sablefish was directed by large trap-geared freezer vessels that landed their catches in a dressed-frozen condition, thus giving few shore sampling opportunities.

When it is not feasible to collect a desired number of samples on shore attention can be directed toward sampling aboard commercial vessels at sea, and the commercial fleet continues to provide excellent co-operation toward that end. The number of such sampling trips depends directly on the amount of manpower available at any given time.

During the summer of 1980, the co-operative hake fishery in Area 3C (that had been taking place on a limited scale for two seasons) expanded greatly. A very high percentage of the larger vessels in the Vancouver-based trawl fleet participated in this fishery. This resulted in fewer trawl landings from a number of other major areas during the summer period and sampling opportunities were limited.

During 1980, there were 262 biological samples collected from commercial groundfish landings at various ports. This was a marked decrease (24%) from 1979. Of the 56,566 fish sampled, nearly all were processed for length measurements and sex data and 34,440 for age determination through the collection of scales, otoliths, fin sections or combinations of these structures. Maturity state readings were collected from most rockfish and roundfish samples, while parabranchial-lesion incidence was noted in the majority of Pacific cod and walleye pollock samples. Incidence of lamprey marks was noted in a significant number of walleye pollock samples and observations relative to stomach contents were indicated in most samples collected for all groundfish species in 1980. The following figures indicate a percentage breakdown by species of the number of samples collected: Pacific cod--30%; rockfish--20%; flatfish--19%; walleye pollock--19%; spiny dogfish--6%; lingcod--3%; sablefish--2%; and Pacific hake--less than 1%. A summary table of samples collected from groundfish landings by species and International (Major) Area is given in Table 1. Details of samples collected during 1980 are given in Tables 2-21 for each species.

ACKNOWLEDGMENTS

The collection of statistics and biological samples from the commercial fishery remains a co-operative effort between port samplers, fishermen and processors. The Pacific Biological Station port sampling staff would like to express their sincere thanks to fishermen and processors for their time and assistance during 1980.

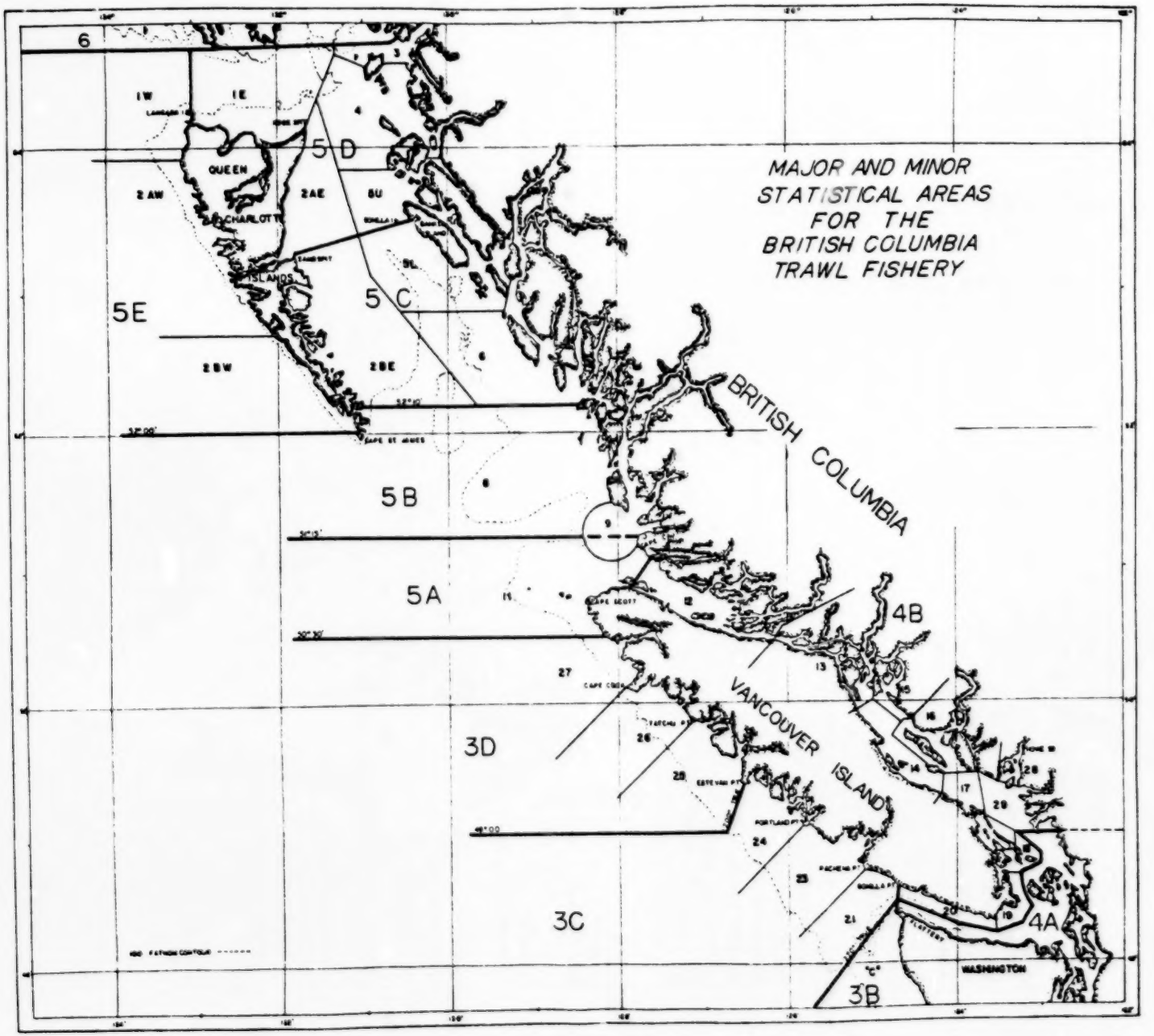
MAJOR AND MINOR
STATISTICAL AREAS
FOR THE
BRITISH COLUMBIA
TRAWL FISHERY
6
1W
1E
5D
QUEEN
CHARLOTTE
ISLANDS
2AW
2AE
2BW
2BE
5E
5C
5B
5A
BRITISH COLUMBIA
4B
VANCOUVER
ISLAND
3D
3C
4A
3B
WASHINGTON

Fig. 1.

Table 1. Number of samples collected from British Columbia groundfish landings in 1980, by species and International Area.

	Area								
	3C	3D	4B	5A	5B	5C	5D	5E	Total
Flatfish									
Arrowtooth flounder	1	-	-	2	2	-	1	-	6
Dover sole	2	3	-	-	-	-	2	3	10
English sole	-	-	4	-	-	2	6	-	12
Petrale sole	-	2	-	-	-	-	-	-	2
Rex sole	-	-	-	-	-	-	1	-	1
Rock sole	-	-	-	3	5	6	3	-	17
Starry flounder	-	-	1	-	-	-	-	-	1
Rockfish									
Canary rockfish	-	-	-	-	3	3	-	-	6
Pacific ocean perch	1	1	-	-	17	7	1	2	29
Redbanded rockfish	-	-	-	-	1	-	-	-	1
Rougheye rockfish	-	1	-	-	-	-	-	-	1
Silvergray rockfish	-	-	-	1	1	2	-	-	4
Yellowmouth rockfish	-	-	-	-	-	-	-	7	7
Yellowtail rockfish	-	-	-	1	3	-	1	-	5
Roundfish									
Lingcod	4	-	-	1	2	-	1	-	8
Pacific cod	7	1	13	3	6	18	31	-	79
Pacific hake	1	-	-	-	-	-	-	-	1
Sablefish	3	-	-	-	-	-	2	-	5
Walleye pollock	-	-	39	-	-	-	12	-	51
Selachii									
Spiny dogfish	7	-	6	1	-	-	2	-	16
Total	26	8	63	12	40	38	63	12	262

Table 2. Arrowtooth flounder (Atheresthes stomias) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3C	July	52-56	5	295	300	5	295	300	VF05501-05800
5A	June	34-43	24	276	300	24	276	300	VF03901-04100, VF04201-04300
	July	55-61	11	289	300	11	289	300	VF04901-05200
5B	May	88-92	86	214	300	86	214	300	VF03301-03600
	Sept	62-72	12	288	300	12	288	300	VF06101-06400
5D	June	55-130	13	287	300	13	287	300	PRF01706-02005
Total fish sampled					1,800			1,800	

Table 3. Dover sole (Microstomus pacificus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3C	Jan	170-300	16	231	247[a]	16	231	247	A9858-9886
3C-3D	Apr	160-280	198	102	300	198	102	300	VF01801-02100
3D	Feb	220-250	53	218	271[a]	53	218	271	A10091-10127
	Mar	200-270	35	265	300[a]	35	265	300	VF00301-00600
	Apr	190-280	200	100	300	200	100	300	VF02101-02400
5D	June	70-146	12	227	239	12	227	239	PRF01467-01705
	Sept	64-84	71	128	199	71	128	199	PRF02706-02904
5E	May	145-198	171	129	300	171	129	300	PRF00887-01186
	Feb	280-380	204	64	268[a]	204	64	268	Y11327-11362
	Mar	280-380	175	38	213[a]	175	38	213	Y11363-11394
Total fish sampled					2,637			2,637	

[a]Maturity data not collected.

Table 4. English sole (Parophrys vetulus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
4B	Jan	10-52	15	181	196[a]	15	181	196	A9887-9910
	Feb	10-48	41	204	245[a]	41	204	245	A10019-10042
		30-42	26	185	211[a]	26	185	211	A9911-9934
		20-42	23	196	219[a]	23	196	219	A10043-10065
5C	Sept	65-76	60	45	105	60	45	105	PRF02905-03204
	Oct	70-72	204	96	300	204	96	300	PRF03205-03504
5D	Feb	65	40	63	103[a]	40	63	103	Y11298-11326
	May	56	112	168	280	112	168	280	PRF01187-01466
	Jan	50-60	67	381	448[a]	67	381	448	Y11220-11256
	Feb	50-60	42	256	298[a]	42	256	298	Y11257-11297
	Mar	48-60	169	131	300	169	131	300	PRF00001-00300
	Nov	50-95	91	207	298	91	207	298	PRF03505-03802
Total fish sampled					3,003			3,003	

[a]Maturity data not collected

Table 5. Petrale sole (Eopsetta jordani) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3D	Mar	200-270	68	232	300	68	232	300	VF00001-00300
	Apr	200-280	257	43	300	257	43	300	VF01501-01800
Total fish sampled					600			600	

Table 6. Rex sole (Glyptocephalus zachirus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length M	F	U	T	Age (otolith) M	F	U	T	Serial number
5D	July	52-58	-	-	100	100[a]	-	-	100	100	PRF02006-02105
Total fish sampled						100				100	

[a]Sample taken from commercial catches at sea. No sex or maturity data collected.

Table 7. Rock sole (Lepidopsetta bilineata) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5A	Mar	38-40	56	244	300	56	244	300	VF00901-01200
	May	38-42	59	241	300	59	241	300	VF02701-03000
	July	37	50	250	300	50	250	300	VF04301-04600
5B	May	21-29	252	48	300	252	48	300	VF03001-03300
	June	36-42	19	78	97[a]	19	78	97	VF04104-04200
		32-44	22	278	300	22	278	300	VF04601-04900
	July	48-59	29	271	300	29	271	300	VF05201-05500
	Aug	45-70	55	245	300	55	245	300	VF05801-06100
5C	June	18-20	43	257	300	43	257	300	VF03601-03900
	July	34-60	156	144	300	156	144	300	PRF02106-02405
	Feb	17-18	20	223	243[a]	20	223	243	A10066-10090
	Mar	15-20	35	265	300	35	265	300	VF00601-00900
	Apr	16-22	8	292	300	8	292	300	VF01201-01500
	May	18-22	42	258	300	42	258	300	VF02401-02700
5D	Aug	35-40	90	210	300	90	210	300	PRF02406-02705
	Apr	16-20	33	266	299	33	266	299	PRF00588-00886
		16-23	9	278	287	9	278	287	PRF00301-00587
Total fish sampled					4,826			4,826	

[a]Maturity data not collected.

Table 8. Starry flounder (Platichthys stellatus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length M	Length F	Length T	Age (otolith) M	Age (otolith) F	Age (otolith) T	Serial number
4B	Feb	10-12	125	247	372	125	247	372	A9935-10018
Total fish sampled					372			372	

Table 9. Canary rockfish (Sebastes pinniger) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	Length-maturity F	Length-maturity U	Length-maturity T	Age (otolith) M	Age (otolith) F	Age (otolith) T	Serial number
5B	Feb	83-108	197	85	-	282	69	29	98	VNRF01001-01100
	Nov	52-92	244	56	-	300	85	15	100	VNRF03201-03300
	May	70-90	234	66	-	300	77	23	100	VNRF01601-01700
5C	May	68-74	131	142	-	273	48	52	100	PRRF01470-01569
	July	100-140	222	90	2	314	79	21	100	PRRF02670-02769
	Apr	68-73	187	127	-	314	64	36	100	VNRF01301-01400
Total fish sampled						1,783			598	

Table 10. Pacific ocean perch (Sebastes alutus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	U	T	Age (otolith) M	F	U	T	Serial number
3C	Feb	140-300	80	166	-	246	32	68	-	100	VNRF00901-01000
3D	Jan	100-240	179	62	-	241	76	24	-	100	VNRF00801-00900
5B	May	115	196	106	-	302	67	33	-	100	VNRF01901-02000
	June	102-117	167	136	-	303	46	54	-	100	VNRF02001-02100
		102-117	58	40	2	100	58	40	2	100	VNRF02101-02200
		105-135	180	119	-	299	67	33	-	100	VNRF02201-02300
		120-130	176	124	-	300	56	44	-	100	PRRF02370-02469
	July	120-140	155	140	-	295	53	47	-	100	VNRF02401-02500
		122-160	139	162	-	301	44	56	-	100	VNRF02601-02700
	Aug	120-130	190	237	1	428	49	50	1	100	VNRF02501-02600
	Sept	119-130	125	172	-	297	39	61	-	100	VNRF02901-03000
	Mar	165-178	290	15	-	305	97	3	-	100	VNRF01201-01300
	May	150-170	206	99	-	305	77	23	-	100	VNRF01501-01600
	June	120-180	151	147	-	298	47	53	-	100	PRRF02170-02269
	July	80-120	185	130	-	315	56	44	-	100	PRRF02870-02969
	Aug	100-129	147	152	-	299	45	55	-	100	VNRF02701-02800
	Oct	120-142	109	186	-	295	36	64	-	100	VNRF03001-03100
	July	80-120	143	144	-	287	46	54	-	100	PRRF02970-03069
	Oct	124-150	138	136	-	274	49	51	-	100	PRRF03666-03765
5C	May	120-180	192	103	-	295	66	34	-	100	PRRF02070-02169
	June	88-110	176	124	-	300	58	42	-	100	PRRF02470-02569
	July	100-140	195	100	5	300	64	35	1	100	PRRF02570-02669
	Oct	110-130	206	94	-	300	71	29	-	100	PRRF04066-04165
	Sept	93-120	122	145	-	267	44	56	-	100	PRRF03266-03365
	June	75-100	212	86	-	298	67	33	-	100	PRRF02270-02369
	Aug	70-90	81	70	-	151	47	53	-	100	PRRF03166-03255
5D	Apr	Unknown	123	177	-	300	44	56	-	100	PRRF01370-01469
5E	Oct	116-130	55	103	-	158	32	68	-	100	PRRF03866-03965
	May	120-130	149	151	-	300	47	53	-	100	PRRF01970-02069
Total fish sampled						8,159				2,900	

Table 11. Redbanded rockfish (Sebastes babcocki) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5B	June	106-113	134	100	234	55	45	100	VNRF02301-02400
Total fish sampled					234			100	

Table 12. Rougheye rockfish (Sebastes aleutianus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
3D	Jan	100-240	34	66	100	34	66	100	VNRF00601-00700
Total fish sampled					100			100	

Table 13. Silvergray rockfish (Sebastes brevispinis) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5A	May	70-105	238	86	324	80	20	100	VNRF01401-01500
5B	Mar	52-92	265	112	377	72	28	100	VNRF01101-01200
5C	May	68-72	280	37	317	91	9	100	PRRF01870-01969
	Sept	80-150	65	35	100	65	35	100	PRRF03366-03465
Total fish sampled					1,118			400	

Table 14. Yellowmouth rockfish (Sebastes reedi) samples taken during 1980.

Area	Month	Depth (fm))	Number sampled: Length-maturity M	F	U	T	Age (otolith) M	F	T	Serial number
5E	May	122-127	156	189	-	345	52	48	100	PRRF01570-01669
		123	142	162	-	304	34	66	100	PRRF01670-01769
	July	122-181	141	169	-	310	55	45	100	PRRF02770-02869
	Sept	120-130	62	77	13	152	50	50	100	PRRF03466-03565
		100-200	71	92	-	163	46	54	100	PRRF03566-03665
	Oct	116-130	80	222	-	302	23	77	100	PRRF03766-03865
		118-130	114	190	-	304	35	65	100	PRRF03966-04065
Total fish sampled						1,880			700	

Table 15. Yellowtail rockfish (Sebastes flavidus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T	Serial number
5A	Sept	65-95	206	71	277	74	26	100	VNRF02801-02900
5B	May	76-80	184	160	344	51	49	100	VNRF01801-01900
		65-115	176	126	302	63	37	100	VNRF01701-01800
	Oct	59-60	212	60	272	79	21	100	VNRF03101-03200
5D	May	45-120	199	68	267	77	23	100	PRRF01770-01869
Total fish sampled					1,462			500	

Table 16. Lingcod (Ophiodon elongatus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	U	T	Age (fin ray) M	F	T	Serial number
3C	July	33-50	190	116	-	306	190	116	306	7571-7876
	June	35-55	41	46	-	87	41	46	87	
	July	37-55	-	-	104	104[ab]	-	-	-	
	Aug	36-42	171	129	-	300[a]	171	129	300	7271-7570
5A	Oct	65-100	-	60	-	60	-	60	60	
5B	June	58-75	133	107	-	240	133	107	240	6731-6970
	July	39-46	155	143	-	298	155	143	298	
5D	Feb	32-40	1	55	-	56	1	55	56	
Total fish sampled						1,451			1,347	

[a]Maturity data not collected.
[b]Sample taken from commercial catches at sea.

Table 17. Pacific cod (Gadus macrocephalus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-cyst-maturity M	F	T	Age (scale) M	F	T
3C	Apr	31-58	65	61	126[a]	65	61	126
	July	31-46	108	117	225[a]	52	68	120
	Sept	40-45	88	106	194[a]	56	64	120
	Apr	34-35	66	33	99	66	33	99
	May	27-45	70	50	120[a]	70	50	120
		38-40	55	65	120[a]	55	65	120
	Sept	42-50	51	69	120[a]	51	69	120
3D	Apr	40-80	104	90	194[a]	63	57	120
4B	Apr	30-50	54	65	119[a]	54	65	119
	Jan	44-52	62	58	120	62	58	120
	Apr	36-45	57	63	120[a]	57	63	120
	Jan	48-66	57	63	120	57	63	120
	Apr	42-63	141	131	272[a]	60	60	120
	Aug	42-56	122	116	238[a]	60	60	120
		50-66	145	146	291[a]	59	61	120

Table 17 (cont'd)

Area	Month	Depth (fm)	Number sampled: Length-cyst-maturity M	F	T	Age (scale) M	F	T
4B	Aug	50-60	142	152	294[a]	53	67	120
	Sept	44-63	65	55	120[a]	65	55	120
		45-62	64	56	120[a]	64	56	120
	Dec	55-70	66	54	120[a]	66	54	120
	Jan	64-100	63	61	124	63	61	124
	Feb	60-95	50	71	121	50	71	121
5A	June	53-64	62	58	120[a]	62	58	120
		58-60	53	67	120[a]	53	67	120
		35-40	58	62	120[a]	58	62	120
5B	Apr	58-70	50	65	115	50	65	115
	May	65-75	64	68	132[a]	64	68	132
	Sept	49-72	59	61	120[a]	59	61	120
	Feb	72-85	59	61	120	59	61	120
	Mar	52-92	66	54	120	66	54	120
	Apr	45-75	64	72	136[a]	57	63	120
5C	Feb	28-43	76	55	131	70	50	120
	Apr	34-36	64	72	136	57	63	120
		28-33	73	46	119	73	46	119
		28-40	62	58	120	62	58	120
		30-36	80	67	147	80	67	147
		34-38	75	92	167	75	92	167
	May	26-35	75	45	120	75	45	120
	June	40-50	57	63	120	57	63	120
		30-70	53	67	120	53	67	120
		60-65	116	131	247[a]	55	65	120
	July	30-33	62	58	120	62	58	120
		34-60	56	64	120	56	64	120
	Aug	42-50	62	58	120[a]	62	58	120
	Jan	55-60	71	49	120	71	49	120
		43-58	65	55	120	65	55	120
		55-64	81	55	136	81	55	136
	Feb	55-60	46	74	120	46	74	120
	Apr	16-22	63	57	120	63	57	120
5D	Feb	48-65	62	50	112	62	50	112
		50-52	59	61	120	59	61	120
	Mar	29-32	78	107	185	54	66	120
	July	19-68	66	50	116	66	50	116
	Feb	50-60	49	59	108	49	59	108
		36-52	85	94	179	57	63	120
		45-50	47	49	96[a]	47	49	96
	Mar	34-44	67	53	120	67	53	120
	Apr	11-15	53	72	125	53	72	125
	May	11-30	97	73	170	69	51	120

Table 17 (cont'd)

Area	Month	Depth (fm)	Number sampled: Length-cyst-maturity M	F	T	Age (scale) M	F	T
5D	June	12-32	62	58	120	62	58	120
		11-36	67	53	120	67	53	120
	July	14-50	66	54	120	66	54	120
	Jan	80-94	67	53	120	67	53	120
		52-62	66	54	120	66	54	120
		46-58	210	194	404	-	-	-
		42-62	75	81	156	-	-	-
		50-60	65	55	120	65	55	120
		49-57	57	62	119	57	62	119
		52-58	69	77	146	60	60	120
	Feb	46-62	72	97	169	58	62	120
		38-58	63	57	120	63	57	120
		58-60	60	60	120	60	60	120
		40-65	87	96	183	-	-	-
	Mar	48-65	49	66	115	48	61	109
		50-60	61	58	119	61	58	119
		48-60	61	58	119	61	58	119
		50-60	96	97	193	-	-	-
	Apr	50-60	55	65	120	55	65	120
	Nov	50-65	55	65	120	55	65	120
	May	15-22	68	52	120	68	52	120
Total fish sampled					11,257			9,028

[a]Maturity data not collected.

Table 18. Pacific hake (Merluccius productus) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	T	Age (otolith) M	F	T
3C	Aug	55	130	187	317	44	56	100
Total fish sampled					317			100

Table 19. Sablefish (Anoplopoma fimbria) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-maturity M	F	U	T	Age (otolith) M	F	U	T	Serial number
3D	Jan	-[a]	85	210	5	300	85	210	5	300	11592-11891
		-[a]	79	163	-	242	79	163	-	242	12192-12433
	Feb	-[a]	68	232	-	300	68	232	-	300	11892-12191
5D	Feb	60	33	73	-	106[b]	33	73	-	106	12434-12539
	Nov	54-62	16	61	1	78[c]	16	61	1	78	16660-16737
Total fish sampled						1,026				1,026	

[a]Depth not available.
[b]Maturity data not collected.
[c]Special sample of small fish.

Table 20. Walleye pollock (Theragra chalcogramma) samples taken during 1980.

Area	Month	Depth (fm)	Number sampled: Length-cyst-maturity M	F	U	T	Age (fin ray) M	F	U	T	Serial number
4B	Dec	-	111	89	-	200	111	89	-	200	P62201-62400
	Feb	40-60	76	145	-	221	32	68	-	100	P60901-61000
		50	-	-	400	400[a]	-	-	-	-	-
	Mar	75-81	73	213	-	286	24	76	-	100	P61701-61800
		65-75	13	87	-	100[b]	13	87	-	100	P37566-37665
		65-75	18	143	-	161[b]	-	-	-	-	-
		62-68	24	76	-	100[b]	24	76	-	100	P37666-37765
		62-68	35	177	-	212[b]	-	-	-	-	-
		75-80	74	309	-	383	12	88	-	100	P61801-61900
		87	11	89	-	100[b]	11	89	-	100	P37766-37865
		87	5	122	-	127[b]	-	-	-	-	-
		87	7	90	-	97[b]	-	-	-	-	-
		87	10	205	-	215[b]	-	-	-	-	-
		78	6	94	-	100[b]	6	94	-	100	P37866-37965
		78	4	156	-	160[b]	-	-	-	-	-
		78	3	92	-	95[b]	-	-	-	-	-
		77	40	104	-	144[b]	-	-	-	-	-
		77	19	81	-	100[b]	19	81	-	100	P37966-38065
		77	6	125	-	131[b]	-	-	-	-	-
		77	17	120	-	137[b]	-	-	-	-	-
		77	17	114	-	131[b]	-	-	-	-	-
		77	15	111	-	126[b]	-	-	-	-	-
		68-75	49	251	-	300	17	83	-	100	P61901-62000
		75	34	218	-	252	12	88	-	100	P62101-62200
		130-160	127	139	-	266	44	56	-	100	P62001-62100
	Jan	40-45	150	88	-	238	120	80	-	200	P60201-60400
	Feb	40-50	36	83	-	119[b]	-	-	-	-	-
		40-80	41	83	-	124[b]	-	-	-	-	-
		40-50	18	73	-	91[b]	-	-	-	-	-
	Jan	40	120	80	-	200	120	80	-	200	P60401-60600
	Feb	35-42	119	83	-	202	58	42	-	100	P60601-60700
		40-50	141	79	-	220	66	34	-	100	P60701-60800
		40-60	175	96	-	271	64	36	-	100	P60801-60900
		40-60	135	60	-	200	67	33	-	100	P61201-61300
		40-50	166	91	-	258	69	31	-	100	P61001-61100
		40-60	114	93	-	207	54	46	-	100	P61101-61200
		60-80	254	125	-	379[c]	61	39	-	100	P61401-61500
		40-50	76	186	-	262	27	73	-	100	P61301-61400
		40-50	115	233	-	348	60	138	-	198	P61501-61700
5D	Feb	40-50	98	101	-	199	98	101	-	199	P52372-52570
		45-50	124	93	-	217	111	88	-	199	P52571-52769
	Apr	50-52	65	135	-	200	65	135	-	200	P52770-52869

Table 20 (cont'd)

Area	Month	Depth (fm)	Number sampled: Length-cyst-maturity M	F	U	T	Age (fin ray) M	F	U	T	Serial number
5D	Aug	60-104	91	109	-	200	46	54	-	100	P53179-53278
	Jan	Unknown	104	96	-	200	104	96	-	200	P51975-52174
		Unknown	86	111	-	197	86	111	-	197	P52175-52371
		30-40	98	74	-	172	-	-	-	-	-
	May	25-100	72	92	-	164	46	64	-	110	P52870-52979
		0-120	96	104	-	200	47	53	-	100	P52979-53078
	Aug	42-60	59	99	-	158	39	61	-	100	P53079-53178
	Nov	50-60	128	126	-	254	53	47	-	100	P53379-53478
		85-95	90	185	1	276	34	65	1	100	P53279-53378
Total fish sampled						10,100				4,303	

[a]Maturity data not collected.
[b]Sample taken from commercial catches at sea.
[c]Special sample.

Table 21. Spiny dogfish (Squalus acanthias) samples taken during 1980.

Area	Month	Depth (fms)	Number sampled		
			Length		
			M	F	T
3C	July	35-40	52	21	73
	May	36-38	19	366	385
		38-40	9	261	270
	Apr	55-56	17	299	316
	July	50-55	54	19	73
	Mar	50-60	0	284	284
	July	45-50	133	9	142
4B	Apr	25-250	275	138	413
		40	36	439	475
	Jan	60-70	81	389	470
		65-70	0	263	263
	Feb	40-50	5	2	7[a]
		40-50	24	38	62[a]
5A	May	80-90	19	288	307
5D	Jan	54-76	0	417	417
		50-200	209	175	384
Total fish sampled					4,341

[a]Sample taken from commercial catches at sea.